

1 June 2023

Dear Ms Collyer,

Re: Draft Report - Review into CER Technical Standards

Evergen Pty Limited (Evergen) welcomes the opportunity to provide the Australian Energy Market Commission (AEMC) with feedback on the Draft Report on the Review into CER Technical Standards (the "Review").

Evergen is an Australian company founded in 2016. We are a software and infrastructure platform for enabling CER monitoring, control, optimisation and orchestration. Rather than being a VPP, we enable VPP owners and CER owners to readily integrate and participate in energy markets.

From early beginnings with residential photovoltaic (PV) and battery systems, Evergen now has more than 11,000 such systems on our platform, making us one of the most significant VPP enablement platforms operating in Australia today. We deliver VPP capability for a large range of clients, including retailers, network service providers and CER system suppliers. We also provide similar capabilities for larger scale renewable energy and storage facilities, and flexible loads such as air-conditioning, hot water and EV chargers. While based in Australia, Evergen is active internationally, with initiatives under way in Europe, Latin America and Japan.

Given our role in the system we feel well placed to provide comments on the impact of CER technical standards across the value chain. We appreciate that the AEMC has chosen to primarily focus this Review on making recommendations for immediate actions to improve compliance with existing CER technical standards (as defined in the NER). However, we believe there are also broader discussions that can be progressed within the scope of the Review on:

- striking a fair balance between grid stability and the economic implications for CER owners in developing and implementing technical standards.
- the need for standards versus market mechanisms and incentives for the active participation of CER in energy markets and the provision of network support services.
- understanding the different capabilities and impacts of different types of CER on the grid and the implications for standards and market development.

Evergen accepts that minimum standards for CER are necessary. However, while some requirements present 'no-regret' scenarios, others may impose significant costs on the owner and installer, with the main beneficiary being the DNSP or AEMO. The analysis in the attachment below highlights that different requirements under AS4777.2 (2020) can be treated separately, given the different cost/benefit profile for each. We also emphasise that CER differs in impact (or benefit!) for the grid, and minimum technical standards should not be applied uniformly across all types of CER. Further, in some instances the owners of CER should be compensated for the benefits that accrue to the DNSP or AEMO.

Also, Evergen is particularly pleased that the AEMC has made a recommendation to progress reform of the national regulation of CER technical standards and we have made a joint submission with

Tesla Redback, sonnen, Fronius, SMA, Solar Edge, and Enphase proposing new arrangements for the governance of CER technical standards. CER is subject to increasing and overlapping requirements that are being developed and implemented in a disjointed manner by a range of different bodies. This can result in suboptimal outcomes for both the customer and the grid. As the Review has also identified there are also barriers to the AEMC and the AER setting rules and regulating OEMs and installers as these parties aren't within the remit of the NER. It is important to progress reform of governance arrangements for CER technical standards to address these issues. Although we appreciate this is a significant task that will require the input and agreement across a number of organisations.

If you would like to discuss any aspect of our submission please don't hesitate to contact me or our Regulatory Affairs Manager at kate.reid@evergen.energy.

Yours sincerely



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Attachment

1. AS4777 requirements - treat them separately

There are a variety of technical requirements imposed on inverter-based CER by AS4777.2 (2020), for a variety of reasons. Evergen notes these requirements differ markedly in both costs and benefits, and in where those benefits accrue. In some cases compliance is 'no regrets' and imposes no cost on the CER owner, to the benefit of everyone. In other cases, there is a cost for the CER owner. Particularly for the latter, there are times when it is highly questionable whether the CER owner should be required to accept this cost to assist a DNSP in deferring network augmentation, or to deliver grid support services, rather than being compensated in the market for providing a grid support service. We will discuss these individually.

- Disturbance ride through to support broad grid stability.

These are covered in Section 4.5 of AS477.2 (2020), in particular Section 4.5.2 "Sustained operation for voltage variations", and Section 4.5.3 "Sustained operation for frequency variations". These require the inverter to 'ride through' short disturbances without disconnecting, to avoid a cascading grid failure when millions of inverters **disconnect** in response to an otherwise short duration transient disturbance. This is a sensible, 'no regrets' technical requirement for CER inverters, it imposes negligible cost on the CER owner, and serves to protect the grid. Evergen supports any measures that the AEMC deems necessary to ensure compliance with this requirement.

- Volt-Watt and Volt-var requirements are for local network support, to defer the need for network augmentation.

These are covered in Sections 3.3.2.2 and 3.3.2.3 of AS4777.2 (2020) respectively. Evergen acknowledges that increasing quantities of distributed photovoltaics (DPV) pose an additional consideration for network operators, and can contribute to localised high voltages. However, it should be recognised that as it stands, the Volt-Watt and Volt-var responses provided through compliance with AS4777 currently serve as a gratis service from inverters to distribution companies at a cost to the CER owner. Nor are the benefits to CER owners as clear as the AEMC suggests.

In their consultation paper, the AEMC regarded these technical requirements as being straightforwardly a net good for consumers because in addition to deferring the need for network augmentation, these requirements allow greater volumes of DPV to be accommodated on the network. Evergen suggests this is not so straightforward, and makes several observations:

1. These requirements impose a direct cost on the CER owner, which cannot be ignored when regarding the costs and benefits of implementing a standard.
2. Accommodating more DPV on the network is not in itself a benefit if that DPV is not permitted to generate active power - a limitless amount of DPV can be accommodated on any network if active generation is limited to zero. In highlighting that these technical standards allow increased accommodation of nameplate DPV, the AEMC neglected to

discuss that each DPV owner may have unforecast reductions in active power output in complying with these requirements.

Policy makers and regulators need to continue making improvements to the regulatory framework to ensure that where it is efficient to increase PV hosting capacity, that DNSPs are appropriately incentivised and enabled to do so, rather than passively using standards to manage voltage. Genuinely increasing PV hosting capacity can only be achieved via grid augmentation, the installation of storage, and load shifting. Evergen also believes further consideration of how CER owners can and should be compensated for providing services is required. This is discussed further below.

- Frequency-Watt requirements are for grid stability.

In addition to specifying frequency disturbance ride through requirements for large (but short-lived) frequency disturbances (Table 4.4), Section 4.5.3 of AS4777.2 (2020) also specifies that inverters must adjust output power proportionally to the frequency disturbance prior to reaching the withstand limits (Table 4.5). This technical requirement mandates that CER owners contribute to grid stability for problems that are likely unrelated to CER, and in a manner that will cost the CER owner (e.g., through OEMS needing to implement mandatory frequency response behaviours).

However, Evergen emphasises that - more significantly - CER owners have the opportunity to participate in the FCAS market by enrolling in VPPs. This again raises the question of whether it is appropriate or desirable to require CER to provide services to the grid without compensation when AEMO has highlighted the need to incentivise aggregated CER.

2. CER vary in their impact and benefits to the grid, and should not be subject to uniform standards

There remains a tendency among system operators and regulators to treat all CER as homogenous. Batteries are very different from PV in their capabilities and impact on the grid. Even without any active control their impact on the grid is a net positive, since their entire default purpose is to soak excess solar and meet excess load. Stationary batteries and EVs will also have very different behaviours and impacts on the grid.

Currently, the same AS4777 technical standard also applies to solar inverters as to battery inverters, with AEMC including some discussion of application to EV chargers (perhaps even prior to consideration of V2G charger/inverters). While disturbance ride through is universally applicable, it is not necessarily appropriate to mandate Volt-Watt, frequency-Watt or Volt-var behaviours at the inverter level, when this can interfere with e.g., AC-coupled solar-battery systems where the battery is already working to reduce grid impacts.

Requiring consumers to curtail solar irrespective of what is happening at a site level can work contrary to both the consumer and network's interests. Also, while DPV only can't be used to bid into the FCAS market, so frequency-watt standards may be relevant, batteries are able to do so and shouldn't be required to provide this as a mandated service.

3. Overlapping and inconsistent requirements

CER is subject to standards and requirements developed and implemented by numerous entities and groups, including Standards Australia, State and Federal governments and regulators, market bodies, DNSPs and others including the Distributed Energy Integration Program (DEIP). Just to mention a few:

- the AS4777.2 standard has been implemented through the NER
- CSIP-Aus was developed by a working group under the DEIP with no regulatory authority and this is now being implemented in various ways by different states and DNSPs
- South Australia and Queensland have developed and implemented different emergency backstop mechanisms.

This undermines the ability for industry and consumers to have a voice in the development of requirements and makes it a complex landscape for OEMs, installers and service providers in which to understand and comply with requirements. It can also lead to overlapping standards and different requirements across different jurisdictions which increase the cost to the owners of CER and lead to sub-optimal outcomes for the grid..

By way of example, DNSPs implement both static and (imminently) dynamic export limits which go beyond AS4777.2 (2020), with the intention to safeguard the local distribution network. This indicates the possibility of DNSPs having a significant influence in defining multiple technical standards. Consequently, the owner of the CER may, at times, find themselves shouldering costs in an unsystematic manner, with behaviours and capabilities overlapping (e.g., the times when more constraining export limits might apply would likely also coincide with AS4777.2 required activity in response to high grid voltages).

4. Other costs of compliance

Evergen acknowledges that the AEMC has sought to minimise the burden on consumers in the recommendations it has made with respect to voluntary measures to improve compliance with AS4777.2. Nevertheless, the complexity of arrangements and multiple stakeholders may mean that it is the consumer and the installer that shoulder most of the burden when trying to troubleshoot and explain questionable device responses, and whether behaviours that impact the consumer negatively are a normal part of AS4777.2 compliance, or require action from the installer, DNSP or OEM.

The ongoing roles and responsibilities for compliance and enforcement of standards need to be clarified, including for consumer education to prevent actions (such as manually changing a region code on an inverter) inadvertently leading to non-compliance. In respect to consumer education, for example, there is a clear role for a regulatory body to deliver consumer education which can be costly and difficult to deliver consistently and should not be left entirely to the installer.

5. Market compatibility and alternatives

While the focus AS/NZS 4777.2:2020 may have been apt at the time of its inception, given autonomous response modes by inverters were a pragmatic way of ensuring CER could participate in voltage management, and contribute to grid stability, the scenario has evolved significantly. Given the costs of a standards based approach to CER owners, along with the difficulties and costs in achieving and monitoring compliance, Evergen urges policy makers to consider where market mechanisms and incentives can and should be used as an alternative to mandating standards.

Industry is already undertaking a range of work to lay the foundation for markets for network support services and incentives. With the introduction of CSIP-Aus and innovation in technology such as Evergen's, which enables the integration and orchestration of CER, CER is now able to be responsive to dynamic network support needs. Trials such as Project Edge, Project Symphony, Project Converge, Project Edith and others have also demonstrated how active CER can deliver services and operate in energy markets. These projects now need to be scaled to enable a shift of focus from imposing blunt requirements on CER to using incentives and rewards for utilising capacity on networks and assisting in managing constraints.

6. Conclusion and recommendations

As discussed in this submission, there are opportunities to begin considering how CER technical standards should evolve to be compatible with different types of CER and more active CER, and where the owners of CER should be compensated for providing services to the grid. A new process for developing and implementing standards also needs to be put in place to improve coordination and transparency and to incorporate a broader range of industry and consumer perspectives.

The joint submission we have provided with Tesla, Redback, sonnen, Fronius, SMA, Solar Edge, and Enphase provides a future focused view on options for a centralised governance framework for CER technical standards that would address these issues.

In summary, Evergen recommends that:

- new governance arrangements be put in place to address the disjointed and fragmented nature of standards development and implementation as proposed in our joint submission
- Current standards should be revisited and future standards developed having regard to the principles recommended in our joint submission that address:
 - market compatibility and alternatives
 - impacts and beneficiaries
 - proportionality and consumer focus
 - differentiated standards for optimised performance,